

# A Q U A P H Y T E

A NEWSLETTER ABOUT AQUATIC, WETLAND AND INVASIVE PLANTS

## Center for Aquatic and Invasive Plants

with support from

The Florida Department of Environmental Protection,

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## Aquatic Weed Training Course Attended by Almost 500 Participants

by Tyler J. Koschnick, University of Florida/IFAS  
Center for Aquatic and Invasive Plants



Every year hundreds of people from the United States and abroad who are involved with aquatic and invasive plant management converge on south Florida to attend the Aquatic Weed Control Short Course. The four-day Short Course is one of the largest Extension programs sponsored by the University of Florida's Institute of Food and Agricultural Sciences (IFAS).

This year over 460 aquatic and invasive plant managers participated to improve their job performance and personal safety and to minimize environmental impacts including damage to non-target species. Florida likely has the largest aquatic plant management program in the world, spending more than \$70 million annually. The state encourages the integration of biological, chemical, and mechanical methods to remove unwanted aquatic and invasive plants.

Under U.S. federal and state laws, applicators of pesticides classified as restricted use (RU) must be trained and certified in general knowledge of proper pesticide use and safety (referred to as core requirements) and in their respective area of work (aquatic; natural areas; turf and ornamental; etc.) Though no currently registered aquatic herbicides are classified as restricted use in Florida, most employers and public agencies insist that their applicators be trained and certified to improve personal safety and application expertise.

The Aquatic Weed Control Short Course is designed primarily to provide the necessary training to certify people in natural area and aquatic weed control categories. The course also is designed to offer continuing education units (CEUs) to those already certified and licensed in aquatic plant management categories. Licenses must be renewed every four years with a required amount of CEUs in each category.

This year's courses included equipment calibration, aquatic and natural areas weed control, core examination standards, reading and interpreting a pesticide label, basic weed science, selective weed management, plant identification, weed ecology, and state and federal rules and regulations.

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The training course concluded with a field day offering airboat safety training and field equipment calibration (above), and an equipment demonstration with a variety of all-terrain vehicles, herbicide spray rigs, granular blowers, mowers, and tractors. See page 7 for more details.

Photo by Tyler Koschnick.

### Mary's Picks!

Items throughout this issue marked with "\*" are from articles that particularly piqued the interest of Mary Langeland, the reader/cataloger for the *APIRS* database.

**Water lilies and scarabs: faithful partners for 100 million years?** by F. Ervik and J.T. Knudsen. 2003. *Biological Journal of the Linnean Society* 80:539-543.

The authors believe scarab beetles have been pollinating night-flowering water lilies since the late Early Cretaceous - "the first unambiguous evidence of a plant-pollinator relationship of this age."

## State Gets Earful From Lake Rousseau Anglers



Above: Rob Hatton introduces DEP's Terry Sullivan (left) at the Lake Rousseau anglers' meeting. Top inset: Rob Hatton speaks with other Lake Rousseau fish camp owners. Bottom inset from right to left: Sullivan, Senator Argenziano, Krummrich and Hatton take a look at the lake.

Photos by V. Ramey.

More than 50 fisher men and women recently took the opportunity to tell state water managers their observations of the plants and fish on Lake Rousseau in west north-central Florida. Some anglers were not happy; some said things were okay - everyone, anglers and water managers alike, agreed that the muck buildup in the lake is affecting fish spawning; they wish there were a way to remove the muck and the advancing *Lyngbya* algae to expose the sandy bottom beneath.

The June 3rd meeting was hosted by Mr. Rob Hatton of the Lake Rousseau RV and Fishing Resort near Dunnellon. Representing the Florida Department of Environmental Protection was Mr. Terry Sullivan, plant biologist with the Bureau of Invasive Plant Management. Representing the Florida Fish and Wildlife Conservation Commission was Mr. Jerry Krummrich, fisheries biologist. State Senator Nancy Argenziano (District 3) also was in attendance and spoke of her concerns.

Mr. Sullivan presented a slide show on invasive aquatic plant management and fielded questions about herbicide toxicity, possible herbicide effects from upstream treatments, treatment

**Audience members asked a variety of questions:** "Aren't the fish contaminated by the herbicides? - why the 3-day fish-consumption restriction?"; "What's causing shoreline plant reduction; isn't there supposed to be a 12-foot fringe all around?"; "Part of the lake bottom has no plants; didn't the herbicides kill off the eelgrass as well as the hydrilla?"; "Why don't you control hydrilla by drawing down the lake like they do at Rodman Reservoir?"; "Why have the floating islands been destroyed?"; "Where have the birds gone?"; "What about saltwater encroachment?"; "Why not put it back the way it was?" While some complained that shoreline plants have been greatly reduced, others complained that their fish camps were difficult to get to because of too many plants. Another said he lost \$100,000 in the six month period that hydrilla got in the way of fishing, but things are good now.

frequency and plant abundance. Sullivan said that hydrilla, which only two years ago filled much of the lake, was now under "maintenance control" thanks to herbicide treatments.

Mr. Krummrich described current electro-fishing data for the lake, saying that Lake Rousseau ranks "average" in its number of bass over 15 inches long, compared to other bass lakes in the state. Krummrich said he does not believe Lake Rousseau has been overfished but that for a number of reasons young fish are not

surviving to adulthood.

Senator Argenziano praised plant and fish management efforts in general but specifically objected to a lack of progress in controlling the nuisance algae, *Lyngbya*. *Lyngbya* is a black-looking blue-green algae that is quickly replacing submersed plant beds in a number of north central Florida rivers and springs. Argenziano believes management agencies are "using band-aids" to control the rapidly expanding algae. *V.R.*

## Lake Toho Muck Removal Project Complete

The largest whole lake enhancement project ever attempted in Florida has been completed on Lake Tohopekaliga near Kissimmee. Now we wait for rain to refill the lake to judge its success. "Lake enhancement" here means "enhancement of fish and wildlife habitat," according to the Florida Fish and Wildlife Conservation Commission's Kissimmee office.

Lake Toho, considered a premiere bass fishing lake, had been suffering from static water levels and excessive plant growth which led to thick deposits of bottom muck. The muck buildup had filled areas needed for feeding by wading birds and spawning by fish.

The plan has been to dewater (draw down) part of the lake, expose 40% of the lake bottom for three months, scrape up and remove more than 9 million cubic yards of muck from more than 3,700 bottom acres, and allow the lake to refill with summer rains. The last truckload of muck was removed and re-filling began on June 15, 2004.

Over time, it is expected that the natural plant seed bank will give rise to healthy stands of knotgrasses, bullrushes, eelgrass and other desirable plants. Workers will manage for the desirable plant species and against the problematic plant species.

This lake enhancement work has pushed back the process of eutrophication on Lake Toho. One expected response to the work is the maintenance of a high level of fish productivity for years to come. *V.R.*

*Photos by Chris Michael, FWC.*

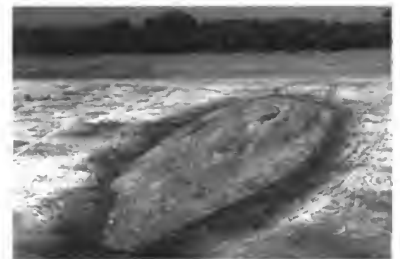


Bulldozers scraped more than 3,700 acres of the exposed bottom of Lake Toho. Here, rows of muck await removal.



About half of the muck was used to construct in-lake wildlife islands.

In another part of the project, University of Florida researchers, under the direction of Mark Hoyer, will measure the plant and animal utilization of the man-made islands over time.



Thousands of truckloads of muck were removed. About half the muck was trucked to upland pastures and other disposal sites.

Lake Toho enhancement is a project of the FWC in cooperation with the South Florida Water Management District, the U.S. Army Corps of Engineers, and the Florida Department of Environmental Regulation, along with researchers of the University of Florida and others. For further information, contact Mike Hulon or Marty Mann of the FWC Aquatic Resources Enhancement Section, 1601 Scottys Road, Kissimmee, FL 34744, 407-846-5300.



*Editor's Note:* This article from 1894 takes place in your editors' own backyard. Thank you to Chet Van Duzer for the contribution. See the announcement of Mr. Van Duzer's forthcoming book, *Floating Islands: A Global Bibliography with an Edition and Translation of G.C. Munz's Exercitatio academica de insulis natantibus (1711)* on page 6.

## "The Islands the Alligators Build"

by Frank M. Chapman, reprinted from *Our Animal Friends* 21(9) (May, 1894), contributed by Chet Van Duzer

Few animals are more friendless than the alligator. With claims to neither beauty nor intelligence, he is not handsome enough to win our admiration, nor dangerous enough to make us respect him. For hours he basks in the sun, floating on the surface of the water, or lying on some muddy bank, apparently as useless as the log of wood he so much resembles. Every man's hand is raised against him. He is killed by the tourist in pure wantonness, simply because he affords a mark for the ever-ready rifle. Hunters slay alligators by thousands for their hides and teeth. Indeed, it is for these alone that the alligator is prized. I think, however, that, like everything else in nature, the alligator plays a part in the drama of animal life for which he is especially adapted.

It is said that on the lower Mississippi River alligators feed on muskrats, and the recent decrease in the number of alligators has been followed by a corresponding increase in the number of muskrats, which seriously weaken the levees by burrowing in them. If this be true, the alligator is here of direct value to the planter, and should therefore be protected by law.

However, my plea for the alligator is not based on his powers as a destroyer of muskrats, but on his services as a land-maker. It does not seem probable that so stupid and sluggish an animal should be a factor in changing a stagnant pool of water - a breeding ground for miasmatic germs - into a fertile pasture where cattle may graze. Nevertheless, I think it can be proven that he aids in accomplishing this remarkable transformation.

Several years ago I passed the winter studying birds and mammals near Gainesville, Florida. Among my especial desiderata were a singular little round-tailed muskrat, known as *Neofiber* (which had previously been found only on the Indian River), and a peculiar semi-aquatic hare. A resident of the region suggested that these animals might be found on the floating islands of "Bevan's Arm." This "Arm," a branch of Alachua Lake, is what is known in Florida as a "bonnet lake." The name will be familiar to any one who has visited Florida, for "bonnet lakes" are abundant throughout the State. Imagine a lake so thickly covered with a growth of pond-lilies that the water shows only in occasional patches. The lilies are both of the yellow and of the white varieties, but the former are by far the larger and more numerous. Some leaves measure eighteen inches in diameter, and the stems of many project nearly two feet above the surface of the lake. The water is sometimes fifteen or twenty feet in depth, and in the clearer spaces much deeper. It is filled with many species of aquatic plants, in which one's oars become entangled, and these, added to the abundance of lily leaves or "bonnets," make rowing a difficult and tiresome matter.

In one of the open spaces near the centre of the "Arm," which was here about half a mile in width, were the islands. There were several of them, irregularly circular in shape and varying in diameter from about ten to nearly fifty feet. They were densely grown with reeds and grasses of many species, and, in some places,

tall flag-like sedges and button baskets grew.

To a naturalist, floating islands possess a strong fascination. They are like earthly satellites floating about in watery orbits. The animals which inhabit them seem to belong to a sphere of their own. The isolation of their island-home affords them protection from their mainland enemies, and this is doubtless why animals are so abundant on the islands in the "Arm." Certain it is, I have never seen a bit of ground of similar extent so densely populated.

Rowing slowly out through the "bonnets," one was greeted by a chorus of frog-like gruntings which seemed to issue from under every lily leaf. It was made by young alligators. The "Arm" was a nursery for them. They were of all sizes, from little fellows six or eight inches in length, born the preceding summer, to fully grown adults measuring ten feet or more. The smaller ones are found in schools, families, perhaps; occasionally, to sun themselves, they crawl upon lily leaves floating on the surface of the water, making as ideal pictures of lazy contentment as one can well imagine. The larger leaves will support the weight of an alligator three feet in length.

One of the larger islands was my daily resort for nearly two weeks, and I will confine my account to the history of this particular island, speaking first of the life upon it, then of its probable origin.

I always approached it with caution, in order that I might have a glimpse of its largest inhabitant. This was an alligator about eight feet in length. His habit of crawling from the water on to the island at a certain place had resulted in his wearing away the shore, until he had formed a miniature harbor. He "builded better than he knew," and here on the muddy shore he dozed the hours away, enjoying, although he did not know it, the fruits of his own or his fellows' labors. On my appearance he would half slide, half roll, off into the water; the waves rippled outward in ever-widening circles; a few bubbles rose to the surface, and I saw no more of the king of the islands that day.

My landing was a few feet beyond. It was made, and my boat "beached" in a unique manner. The island was two to three feet in thickness, and floated in water from fifteen to twenty feet in depth. As I stepped from my canoe on to its edge it sank slowly beneath my weight, and, stepping backwards, I could thus draw the floating canoe after me; but as I advanced toward the centre of the island the shore rose, and the canoe was lifted from the water by this kind of natural drydock.

Progress now was very much like walking on cracked or partially melted ice. Where the grass grew thickly there was a firm footing, but the spaces between the little hillocks were treacherously soft. To fall through an island would no doubt be a novel experience, but one that the experimenter would doubtless never attempt again.

Although none of the residents were visible, it required but a glance to show that this island was thickly populated. Broad avenues entered and left the water. There was a network of roads,

pathways and trails leading to grassy nests well hidden at the base of a hillock, or to underground tunnels with entrances half-closed with mud. Close inspection showed the tracks of many feet. As I walked carefully about this city - for it was nothing less - I felt like a Brobdingnag in Lilliputia. While the place was apparently deserted, I knew that the inhabitants were all at home. With them it was night, and my presence was doubtless causing many a heart near me to beat with unaccustomed rapidity.

On this little fragment of earth there proved to be representatives of almost every class of the animal kingdom. The broad avenues leading to the water were made by the marsh hare. This hare resembles our common "cotton-tail," but its tail is of drab, and not of white, cotton, while its feet are less heavily furred and are partly webbed. Its presence on these islands shows how aquatic are its habits. It swims readily, and is thus especially fitted to live in the low-lands of the South, where floods are more or less frequent. Indeed, the habitat of this hare and its congener, the water hare, is entirely included within that part of the lower Mississippi Valley and adjacent regions which is subject to inundations.

The smaller paths led to nests of dry grasses in the hillocks. These were the homes of marsh-rats, a native species, smaller than our imported house-rats, and with a denser, heavier fur, which sheds water easily, and thus forms an excellent suit for these swamp-loving animals. The underground passages proved to have been made by the rare neofiber, and there were also some of its singular dome-shaped houses, built of woven grasses, with a single chamber, having both exit and entrance.

Here, then, were three species of mammals living in harmony on a bit of ground only a few yards square.

Many species of birds occasionally used the island as a nesting place. There were white herons and blue, bitterns, ducks and others; but I will tell only of those which seemed to make the island their home. Of these probably the most common were the boat-tail grackles, a name they have acquired from their habit when on the wing of holding their long tail-feathers on edge, as it were, the tail thus resembling in form the hull of a boat. The males are beautiful birds, with glossy blue-black plumage, while the females are of an inconspicuous dull brown. They place their large nests of grasses in the tall flags, laying eggs curiously ornamented with hieroglyphic-like markings.

There were also great numbers of red-winged blackbirds, the males having scarlet epaulets, and the females, as usual, being dull, obscure-looking birds, but I do not think they nested on this particular island.

Green herons built their platform-like nests of sticks in the button-bushes near by. Their young were ungainly accumulations of wings, legs, and a long neck, all radiating from one small centre, and a scanty covering of white hair-like feathers did not add to their gracefulness. A strange, startling voice I heard sometimes in the reeds probably belonged to a king rail, who showed himself on only one or two occasions. It was a most singular cry, a loud *Bap, Bap, Bap*, many times repeated, as though some one was rapidly striking a resounding board.

Florida gallinules were always common, and in May a number of their purple cousins arrived from the South. It was a pleasure to watch these graceful birds stepping daintily over the lily leaves while feeding. Their many strange notes all bore a suggestion of the barnyard about them, a character quite out of keeping with their

surroundings. I found only one nest, constructed of reeds and placed like a staging over the water. The plumage of the purple gallinule is of a deep indigo below and of a bright greenish-blue above, and it wears a scarlet helmet. Its under tail-feathers are white, and when the bird is on the wing, holding its tail at right angles to the plane of its body, this white mark becomes a conspicuous object.

One morning I found a "pellet" which had been disgorged on the island by some owl. It contained the skull of a cotton-rat, which had probably fallen victim to a barred owl.

Of reptiles, in addition to the alligators, there were snakes and turtles. One morning I saw a hideous moccasin snake lying coiled in the grasses almost at my feet - a loathsome creature, nearly four feet in length, possessed of a power which rendered his very hideousness strangely attractive. Poisonous snakes have the sort of fascination for us that belongs to scaffolds and guillotines and other means of sudden and violent death. I killed this snake and took him home as a specimen, assuring myself, however, that he was thoroughly dead before placing him in the canoe, where he would not have proved an especially desirable companion had he revived when I was halfway to the shore.

A few days later a small water turtle which had come ashore to lay its eggs was found. It had laid one egg in a small hole at the base of a hillock, and another was laid in the canoe.

Doubtless there are several kinds of insects on the island, but I found only one species. This was an ant. Probably the ants on this little detached world were more numerous than all the other animals combined. They lived in the only dry spot, a little mound near the centre of the island. Their home was inconspicuous, and might have escaped notice entirely had I not sat down on it!

To return now to the history of these islands and the part alligators play in building them. These gigantic lizards love to lie in the soft mud at the bottom of lakes; and they carefully select such places in which to hibernate during the colder months.

Now, if one could see a "bonnet" lake from which the water had disappeared, it would be noticed that its bottom is a network of interlacing lily-pads. The roots are as large as a man's arm, and it will be readily seen how they would prevent a large alligator from snugly nestling in the oozy mud. The alligator, therefore, prepares his bed by biting and pulling out these roots, and they come floating to the surface, showing plainly the marks of his teeth, to form the framework of a future island. Every stage of its growth could be seen in the "Arm." Numbers of these roots float together and form a kind of raft. A scum collects about it, dust settles upon it, and the whole soon looks like a sheet of mud which undulates with the waves. As it becomes firmer, a small plant, always of the same species, makes its appearance, entirely covering the island, and growing so evenly that one might suppose its seed had been carefully sowed by hand. Later stages are now merely questions of time, but it is probably only a few years before the roots torn from the bed of the lake by the alligator are firmly woven into a compact mass by the grasses and reeds which take possession of it, and we have then an island quite similar to the one I have described.

This, it is true, is not a pasture, but it may become one at any time. Some day a strong wind will blow this island ashore-indeed, I saw islands which had been stranded-and then the roots in its bottom will prove living anchors, holding it to its moorings, and by and by the floating island will become firm ground over which



cattle may graze. As island after island is blown against this one, the "Arm" recedes, the shore becomes dryer, and ere long it will be firm enough to support cattle which are attracted by its luxuriant growth of grasses.

And now what becomes of our villagers? Search the shore as you will, comparatively few traces of them are to be found. Robbed of the isolation of an insular life, they soon disappear to seek new homes where they will be more secure from the attacks of their enemies. The alligator gives place to the cow, the grassy nests of the marsh-rats and neofiber are soon overturned by prying pigs.

### Coming Soon!

#### Floating Islands: A Global Bibliography with an Edition and Translation of G. C. Munz's *Exercitatio academica de insulis natantibus* (1711)

by Chet Van Duzer

This book is a unique treasury of information about one of nature's marvels: floating islands. The bibliography contains more than 1500 citations of books and articles in twenty languages on the subject; the entries are annotated and cross-referenced, and there are both thematic and geographic indices. All aspects of floating islands are addressed, including the formation of floating islands, the causes of their buoyancy, their role in the ecology of lakes and wetlands, their flora and fauna, their role in the dispersal of plants and animals, and methods for controlling and managing them. Works are also cited on artificial floating islands used for agriculture, human habitation, wildlife habitat, and improvement of water quality; and floating islands in literature, myth, and legend. The book includes the text and an English translation, with detailed notes, of G. C. Munz's rare 1711 thesis on floating islands, *Exercitatio academica de insulis natantibus*, as well as photographs of several floating islands.

Hardcover, 27 cm, 415 pp. with indices and illustrations.

ISBN 0-9755424-0-0

Library of Congress Control Number: 2004093899

Forthcoming from Cantor Press (Summer 2004)

"Chet Van Duzer has done the long, hard, exhaustive, in-depth, multidiscipline, and multilingual 'homework' for all the world's researchers of floating islands, and for others interested in a fascinating natural feature." - Peter A. Stone, Hydrologist, South Carolina Department of Health and Environmental Control, USA.

#### \* On the uses of *Zostera marina*, mainly in Norway, by T. Alm. 2003. *Economic Botany* 57(4):640-645.

This ethnobotanical review found that in Norway in the 1700s to the 1800s this abundant marine grass was used variously as manure; stuffing for mattresses; for filling between the logs of wooden houses; as fodder for cows; to prepare fish; and as ground cover for sheep.

#### \* California butterflies: at home with aliens, by P.D. Thacker. 2004. *BioScience* 54(3):182-187.

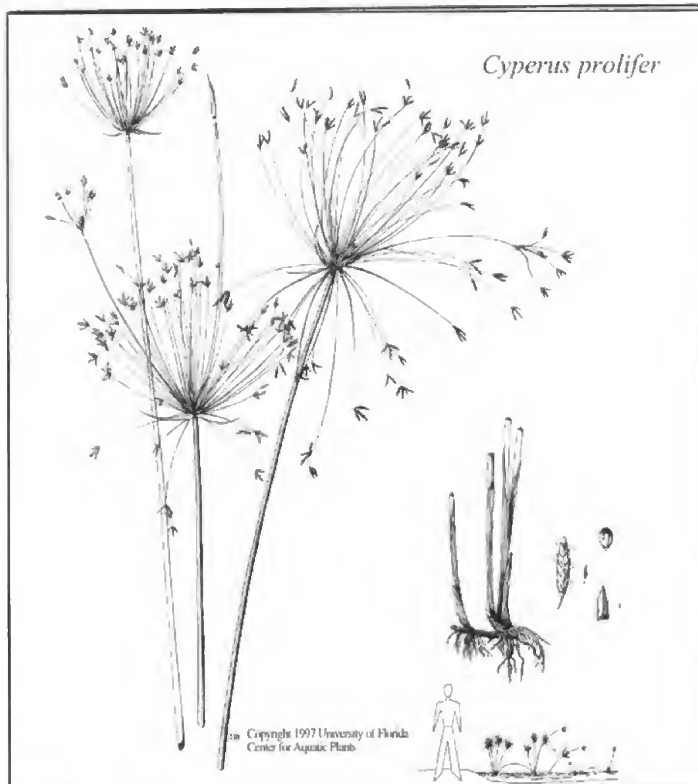
Faced with the loss of its favorite food, stinging nettles, local populations of the red admiral butterfly came across a plant with a similar chemistry, baby's tears, a non-native ground cover used in California. The red admiral switched from its native host to the alien plant. In Davis, California, apparently that is not so strange; other butterflies have switched to alien plants too.

#### \* Linking Ecology and Horticulture to Prevent Plant Invasions, <http://www.centerforplantconservation.org/invasives/>

Who's helping stem the spread of invasive plants? Here you can read the separate "codes of conduct" against using invasive plants by government, nursery professionals, the gardening public, landscape architects and arboreta and botanic gardens.

#### \* Species inventory and the local users of the plants and fishes of the Lower Soudi Miriu wetland of Lake Victoria, Kenya, by J. Gichuki, F. Dahdouh Guebas, J. Mugo, C.O. Rabuor, L. Triest, F. Dehairs. 2001. *Hydrobiologia* 458:99-106.

Among other plant uses discussed, the claim is that "a house that uses *Cyperus papyrus* for its roof is cooler, and also cheaper to make and maintain than a comparable corrugated roofed house."



## Aquatic Weed Training Course - Continued from Page 1

Presentations also were given on general safety issues for people working in the field. These included identification of venomous snakes by the Florida Fish and Wildlife Conservation Commission and information on heat stroke, exhaustion and dehydration by the University of Florida Health Sciences Department.

Reviewed subjects included pesticide safety, *Lygodium* management, ditch bank and upland weed control, biological control of *Melaleuca*, the herbicide registration process, mosquitoes and their relationship to aquatic plant control, as well as updates on active ingredients found in herbicides.

Exams were offered on the last day, and approximately 160 people were tested on core requirements or one of the specialized categories.

The University of Florida is one of the only institutions in the country that offers a Short Course specific to aquatic plant management. The University of Florida's IFAS Center for Aquatic and Invasive Plants is dedicated to research, extension (see sidebar), and education as it pertains to invasive plant management on a local, state, national and international level.

With thousands of certified aquatic pesticide applicators in Florida, we anticipate another successful course in 2005. Every year, a contingent from other countries arrives to learn about management practices for aquatic invasive plants in the United States. We welcome and encourage attendance from those abroad.

**Mark your calendars for the 2005 Aquatic Weed Control Short Course: May 16<sup>th</sup>-20<sup>th</sup>, 2005, Fort Lauderdale, Florida. See: <http://conference.ifas.ufl.edu/aw/>**



Participants learn how to calibrate a granular herbicide blower mounted on the back of an all-terrain vehicle (ATV). Photo by Tyler Koschnick.

## Land-Grant Universities and Extension

**Land-grant universities** were established by Congress and signed into law by Abraham Lincoln in 1862 with the purpose of educating citizens in agriculture, home economics, mechanical arts, and other practical professions. At that time, more than 50 percent of the U.S. population lived in rural areas, and 30 percent of the workforce was engaged in farming. Land grant institutions received funding and/or grants of land.

There are more than 100 land-grant colleges and universities in the U.S. that help meet public needs by providing practical, applied, non-credit programs called **Extension Programs**. These programs are provided through thousands of county and regional extension offices to bring land-grant expertise to local levels. Extension was formalized by legislation in 1914 and established the partnership between land-grant institutions and the U.S. Department of Agriculture. Extension was defined as "developing practical applications of research knowledge, and giving instruction and practical demonstrations of existing or improved practices or technologies in agriculture."

During both World Wars and the Great Depression, land-grant institutions and the Extension Service played dramatic roles in the increase of food production, improvements in marketing and preservation of fresh foods, development of buying and selling cooperatives, and the teaching of home economics including nutrition, canning surplus foods, home gardening and poultry production, skills that helped many farm families survive the years of economic depression.

Today, fewer than 2 percent of Americans farm for a living and only 10 percent live in rural areas. Yet the USDA Cooperative Extension Service, together with land-grant universities and colleges, still serves rural, urban, and suburban citizens by teaching agricultural, natural resource, family and community skills at the local level, including aquatic plant management!

**\* Evidence for seed dispersal by the catfish *Auchenipterichthys longimanus* in an Amazonian lake,** by S. Mannheimer, G. Bevilacqua, E.P. Caramaschi and F.R. Scarano. 2003. *Journal of Tropical Ecology* 19:215-218.

The stomachs of 40% of the Amazonian catfish studied contained fruits, infructescences or whole seeds of various plants, including *Alchornea schomburgkiana*, *Licania*, *Psychotria*, *Bredemeiera*, *Malonetia*, *Ludwigia*, *Oryza* and *Paspalum*. "This result indicates dispersal potential and similar findings have been reported previously for other catfishes."



## Books/Reports

### AQUATIC AND WETLAND PLANTS OF SOUTHERN AFRICA, by C.D.K. Cook. 2004. 282 pp.

(Published by Backhuys Publishers, POB 321, 2300 AH Leiden, THE NETHERLANDS. ISBN 90 5782 142 7. EURO86.00 plus S/H. Email: backhuys@backhuys.com WWW: <http://www.backhuys.com>)

This large format book, by one of the foremost botanists in the world, is the first ID manual for the aquatic and wetland plants of southern Africa. More than 480 species, subspecies and varieties are fully described with ecological notes, distributions and illustrations. Another 117 species are given shorter treatment.

The author notes that biological diversity, "an objectively measurable parameter," is one criterion that should be used in deciding how to manage and conserve wetlands. As he has reduced botanical terminology to a minimum in this book, he hopes that it will make it easier, "even for the untrained naturalist," to identify aquatic and wetland plants in southern Africa.

### WETLAND RESTORATION HANDBOOK FOR WISCONSIN LANDOWNERS, 2<sup>nd</sup> Edition, by A.L. Thompson and C.S. Luthin. 2004. 155 pp.

(Published by Bureau of Integrated Science Services, Wisconsin Department of Natural Resources, POB 7921, Madison, WI 53707. Free. Phone: 608-266-0531.)

This is the 2nd edition of this award-winning reference and guide, written for farmers and other private landowners who are interested in converting their pastures back into wetlands. It is a very readable, understandable book that is used for training throughout the Great Lake states. Much of its information is applicable elsewhere in the U.S. Chapters cover wetland definitions, assessing potential for restoration, planning the restoration, choosing plants, carrying out the plan, managing the wetland and invasive species, regulation, helpful agencies, monitoring, and case studies.

### HARMFUL INVASIVE SPECIES: LEGAL RESPONSES, edited by M.L. Miller and R.N. Fabian. 2004. 236 pp.

(Published by the Environmental Law Institute, 1616 P Street NW, Washington, DC 20036. ISBN 1-58576-073-0. US\$69.95 plus S/H. WWW: <http://www.eli.org>)

"This volume reveals that the threat from invasive species is not generally addressed by coherent law and policy. We hope this volume provides a substantial push toward recognizing this serious problem, and toward finding policies that begin to deal with it."

This book describes the law and policy regarding harmful non-indigenous species in six countries - New Zealand ("the only country that has even tried to implement a comprehensive policy . . ."), Germany, South Africa, Argentina, Poland and the U.S. The editors state that 1) in many countries there is basic confusion even over the terminology; 2) most countries have not conducted a comprehensive assessment of the status of non-indigenous species; 3) major legal "gaps" exist in the laws of most countries; and 4) most countries "do not seem to be pursuing dramatic changes in their laws and policies."

### EVERGLADES CONSOLIDATED REPORT - 2004 Executive Summary, by the South Florida Water Management District and the Florida Department of Environmental Protection. 2004. 33 pp, plus CD.

(Published by the South Florida Water Management District, POB 24680, West Palm Beach, Florida 33416-4680. Also on the WWW: <http://www.sfwmd.gov/org/everglades>)

Billions of dollars are being spent to restore water quality and flow in the Everglades. The 30-year project is well underway. Among the goals: reduce phosphorus to 10 parts per billion by purchasing land, building Stormwater Treatment Areas (STAs) and implementing agricultural Best Management Practices (BMPs); reduce mercury emissions into the atmosphere and accumulation in fish; reduce the encroachment of cattail into sawgrass

marshes; and control exotic plants, particularly the trees melaleuca and Brazilian pepper. This publication reviews the work completed to date, and presents the Everglades Forever Act, a Florida law.

### VELDGIDS WATER-EN OEVERPLANTEN, (Fieldguide Aquatic Macrophytes) by R. Pot. 2003. 352 pp.

(Published by KNNV-uitgeverij, Utrecht @ Stowa, Utrecht, THE NETHERLANDS. ISBN 90 5011 151 3. EUR29.95 plus S/H. WWW: <http://www.waterplanten.info>)

This field guide in Dutch presents all the known aquatic macrophytes, mosses, stone-works and macroalgae of The Netherlands and surrounding countries. More than 200 color pictures and 300 line drawings help identify the species. Some information on ecology and management also is given for all species. It is a very nicely produced hardbound field guide-sized book.

### COSTA RICA - AQUATIC PLANTS OF PALO VERDE NATIONAL PARK AND THE TEMPISQUE RIVER VALLEY, by G.E. Crow. 2002. 296 pp. Full text in Spanish and English.

(Published by Instituto Nacional de Biodiversidad, INBIO, Apdo. Postal: 22-3100, Santo Domingo de Heredia, Costa Rica. ISBN 9968-702-62-5. \$17.00 plus S/H. WWW: <http://www.inbio.ac.cr>)

Every page of this book meant for students and working biologists is in English and Spanish.

The book treats 134 species of tropical aquatic plants, all of which occur in the Palo Verde National Park, one of the most important swamps of Costa Rica. (The author estimates that about 320 species occur in freshwater aquatic and wetland habitats in Costa Rica.) The book includes 7 keys to the plants. Plants are presented in order of family and each plant is described in terms of habitat, morphology, phenology and distribution. Hundreds of color pictures and drawings accompany the text.



## ENCYCLOPEDIA OF WATER GARDEN PLANTS, by G. Speichert and S. Speichert. 2004. 320 pp.

(Published by Timber Press, 133 SW Second Ave, Suite 450, Portland, OR 97204-3527. ISBN 0-88192-625-6. US\$49.95 plus S/H. WWW: <http://www.timberpress.com> Phone: 1-800-327-5680.)

This very well-produced book features more than 700 excellent large color photographs of native and non-native aquatic plants including marginal, floating, bog and submersed plants.

The plants are presented in alphabetical order according to habit. Each of the several hundred species is treated with short non-technical descriptions of how to propagate, plant and care for them, and other notes: "Spiked rush plays well with others, not taking over and killing other plants." The book has no key to the plants.

Considering how much environmental and economic damage non-native aquatic plants are increasingly causing here and elsewhere, it is disconcerting that the authors make little attempt in this book to educate their audience about wise plant selection - many of the plants depicted and discussed are among our worst, and prohibited, non-native invaders - some are unabashedly suggested as useful pond plants. Here was a missed opportunity to help educate aquatic gardeners by separately listing the non-natives, discussing the consequences of using invasive non-natives which might well escape their outdoor aquatic gardens, and suggesting native alternatives to the use of non-natives in outdoor areas large and small.

## LANTANA: CURRENT MANAGEMENT STATUS AND FUTURE PROSPECTS, by M.D. Day, C.J. Wiley, J. Playford and M.P. Zalucki. 2003. 128 pp.

(Published by Australian Centre for International Agricultural Research (ACIAR), GPO Box 1571, Canberra, Australia 2601. ISBN 0 186 320 374 5. <http://www.aciar.gov.au>)

"Lantana was the first weed to be targeted for biological control and has been

researched longer than any other weed [since 1902]. Yet the program is one of the least successful."

*Lantana camara*, a pantropical weed, has more than 650 varieties in 60 countries. This book is a summary of what is known about lantana, its taxonomy, and its control, including a comprehensive review of 40(!) biocontrols which have been developed and released against the plant. It is suggested that biocontrol has had limited success in controlling *Lantana camara* because of this plant's capacity to hybridize between varieties and closely related species.

## THE MEASUREMENT OF ENVIRONMENTAL AND RESOURCE VALUES - THEORY AND METHODS, by A.M. Freeman III. 2003. 491 pp.

(Published by Resources for the Future, 1616 P Street, NW, Washington, DC 20036-1400. ISBN 1-8918532-63-5. WWW: <http://www.rff.org>)

This book on environmental economics presents ways to use economic theories and mathematics to figure out the various "values" of natural units such as forests and wetlands, and of natural resource services such as pollution control and recreational use of rivers. Referring to economic models, the author attempts to explain that his "major purpose in adding to this literature is to provide a definition and measurement of welfare effects of changes in quantities or qualities of environmental and resource service flows." After he's done this, he attempts to explain how "we use that information to make choices about public policy alternatives." Later, the author gets into describing and evaluating "the currently available methods and techniques for estimating the monetary values of changes in human health that are associated with environmental changes" such as the "marginal value of reduced pollution."

This book full of economic equations is not for the faint-hearted. If you're looking for information about the value of a *Scirpus* marsh, or the value of a canoeist on a stream, you'll have to do the math - there are no charts of answers here.

## AQUATIC AND WETLAND PLANTS - A FIELD GUIDE FOR NON-TROPICAL AUSTRALIA, by N. Romanowski. 1998. 119 pp.

(Published by University of New South Wales Press, Sydney, NSW 2052, AUSTRALIA. ISBN 0 86840 632 5. AUS\$37.95 (US \$26.00), + S/H. <http://www.unswpress.com.au/>)

About 340 native and non-native plants in Australia are described and pictured in this handbook. The descriptions are short but useful, the pictures are small but colorful. Plants are listed by family; the index is according to scientific and common name. As in the U.S., terms for "types of wetlands" in Australia apparently are numerous. "Damlands," "sumplands," "ephemeral wetlands" and "billabongs" are among wetland types listed in this book.

## ALIEN SPECIES AND EVOLUTION - The Evolutionary Ecology of Exotic Plants, Animals, Microbes, and Interacting Native Species, by G.W. Cox. 2004. 379 pp.

(Published by Island Press, 1718 Connecticut Avenue NW, Suite 300, Washington, DC 20009-1148. ISBN 1-55963-009-4. \$40.00 (paper) plus S/H. WWW: <http://www.islandpress.org>)

This is the latest of the book invasion from Island Press. In this work, the author reviews hundreds of primary sources on the subjects of evolution, hybridization and adaptation, especially in relation to invasive species.

This very well-written book includes fascinating chapters on adaptation of plants to alien herbivores and diseases, and adaptation of native herbivores to alien plants in which the author reviews several examples of each. He believes that native species "have a considerable capacity for evolutionary adaptation to invading species that offer opportunities for exploitation or challenges to survival" and that "the pattern of interaction that develops between alien species and these new enemies can lead to patterns of rapid evolution in both alien and native species."

**Continued next page -**



## THE MOSQUITO WARS - A History of Mosquito Control in Florida, by G. Patterson. 2004. 263 pp.

(Published by the University Press of Florida, 15 NW 15 ST, Gainesville, FL 32611-2079. ISBN 0-8130-2720-9. US\$55.00 plus S/H. Phone: 1-800-226-3822. WWW: <http://www.upf.com>)

Yellow fever, malaria and dengue fever are diseases carried by mosquitoes. These diseases plagued Florida during the 1800s. Yellow fever was the worst; wave after wave of epidemics ravaged our cities and entire towns were quarantined. In 1877 in Fernandina, 70% of the population had contracted yellow fever; many died. The Jacksonville epidemic of 1888 resulted in nearly half the population fleeing the city in sheer panic. Believing that yellow fever was spread by personal contact, people fled one another. By 1900 it was finally believed that mosquitoes spread diseases. Florida State Board of Health's "Circular No. 1" issued in 1903 to combat diphtheria and malaria, identified the *Anopheles* genus of mosquitoes as the vector. According to the author, thus began Florida's war against mosquitoes.

There are about 170 species of mosquitoes in the U.S.; 75 species in Florida. People who visit places like Flamingo in the Everglades are simply amazed by the instant furious onslaught of mosquitoes that descend on anyone who ventures to step into the open; imagine the entire state being like that.

This book recounts the saga of the men and women who took Florida away from the mosquitoes - a "heroic and sometimes tragic story." It is a surprisingly interesting and entertaining book, well-researched and balanced, and presented in a lively manner - take it with you to the beach!

## WATER AND WETLAND PLANTS OF THE PRAIRIE PROVINCES - A Field Guide for Alberta, Saskatchewan, Manitoba, and the Northern United States, by H. Lahrng. 2003. 326 pp.

(Published by Canadian Plains Research Center, University of Regina, 3737 Wascana Parkway, Regina, Saskatchewan S4S 0A2, CANADA. ISBN 0-88977-162-6. US\$29.95 plus S/H. Phone: 306-585-4758. Email: [canadian.plains@uregina.ca](mailto:canadian.plains@uregina.ca) WWW: <http://www.cprc.uregina.ca>)

More than 300 exceptional photographs and 300 line drawings illustrate this handbook of more than 400 species. Most species are described in two full pages that include pictures, drawings, synonymy and etymology, description, habitat and distribution, related species and special information: *Glycyrrhiza lepidota*, wild licorice, is a wetland perennial whose fragrant and extremely sweet root extracts are used by the confectionary and tobacco industries.

This book features several easy-to-use keys to 1) the families; 2) the grasses, sedges and rushes; 3) the many Canadian pondweeds (*Potamogeton*); and 4) the cotton-grasses (*Eriophorum*).

## WETLAND PLANTS OF QUEENSLAND - A Field Guide, by K.M. Stephens and R.M. Dowling. 2002. 146 pp.

(Published by CSIRO Publishing, 150 Oxford Street, POB 1139, Collingwood Victoria 3066, AUSTRALIA. ISBN 0-643-06674-8. AU\$39.95 plus S/H. Email: [publishing.sales@csiro.au](mailto:publishing.sales@csiro.au) WWW: <http://www.publish.csiro.au>)

This is a field guide to the identification of the 90 most common and widespread wetland plants of Queensland. (Their term "wetland plants" includes truly aquatic plants such as hydrilla and water lilies.) Habit, distribution, leaves, flowers, flowering period, and fruit are described. A distribution map accompanies each as does a smallish color photograph. The authors believe the book would be useful to those wanting to restore or rehabilitate wet areas disturbed by roads, bridges, mining and housing.

The book includes a general key to the genera, then genera keys to the species. (Australia has four species of *Vallisneria*, including the non-native *Vallisneria americana*.)

## A GUIDE TO CREATING VERNAL PONDS, by T.R. Biebighauser. 2002. 32 pp.

(Published by USDA Forest Service, 2375 KY Highway 801 South, Morehead, KY 40351. Phone: 606-784-6428. WWW: <http://www.southernregion.fs.fed.us>)

This pamphlet, published by the USDA in cooperation with Ducks Unlimited and the Izaak Walton League, describes techniques to create a vernal pond (a seasonal wetland) "that looks and functions like a natural wetland," techniques that have been "used successfully in Kentucky, Ohio and Minnesota."

In three pages, vernal ponds are described; in 11 pages planning is described; in 14 pages construction is described. The author states that new ephemeral wetlands can be dug by bulldozer or backhoe, or can be instantly created using dynamite - "the USDA Forest Service maintains a cadre of certified blasters who are available to help."

According to the text, the place will "appear natural in a few years." Can one of these "vernal ponds" appear natural or function naturally if the pond is lined with plastic liner, as the pamphlet recommends in some situations?

This pamphlet can be viewed and/or downloaded at: <http://www.southernregion.fs.fed.us/boone>

## \* Viscoelasticity of the giant reed material *Arundo donax*, by A.E. Lord. 2003. *Wood Science and Technology* 37(3-4):177-188.

Using highly advanced measurements and modeling, the authors show why giant reed "is almost exclusively the material of choice to manufacture woodwind musical instrument reeds."

## \* Zero water flows in the carnivorous genus *Genlisea*, by L. Adamec. 2003. *Carnivorous Plant News*. 32:46-48.

*Utricularia* carnivorous plants have bladders that suck in their prey, but how is prey captured in plants of the carnivorous plant genus *Genlisea*? This is especially mysterious considering that in *Genlisea* traps there is no water flow, no pumping to create a vacuum.



## FROM THE DATABASE

Here is a sampling of the research articles, books and reports which have been entered into the aquatic, wetland and invasive plant database since Winter 2003.

The database contains more than 63,000 citations. To use the free APIRS database online, go to <http://plants.ifas.ufl.edu/> and click on APIRS Online Database.

To obtain articles, contact your nearest state or university library, or a document delivery service.

### Anastasiou, C.J., Brooks, J.R.

Effects of soil pH, redox potential, and elevation on survival of *Spartina patens* planted at a west central Florida salt marsh restoration site.

WETLANDS 23(4):845-859. 2003.

### Andrew, W., Haller, W.T., Shilling, D.G.

Response of St. Augustine grass to fluridone in irrigation water.

J. AQUAT. PLANT MANAGE. 41:61-63. 2003.

### Arora, A., Singh, P.K.

Comparisons of biomass productivity and nitrogen fixing potential of *Azolla* spp.

BIOMASS AND BIOENERGY 24(3):175-178. 2003.

### Bennett, A.C.

Alligator weed (*Alternanthera philoxeroides*) control in Florida sugarcane.

IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P. 7 (ABSTRACT). 2003.

### Boeger, M.R.T., Poulson, M.E.

Morphological adaptations and photosynthetic rates of amphibious *Veronica anagallis-aquatica* L. (Scrophulariaceae) under different flow regimes.

AQUATIC BOT. 75:123-135. 2003.

### Bugbee, G.J., White, J.C., Krol, W.J.

Control of Variable watermilfoil in Bashan Lake, CT with 2,4-D: monitoring of lake and well water.

J. AQUAT. PLANT MANAGE. 41:18-25. 2003.

### Busey, P.

Reduction of torpedograss (*Panicum repens*) canopy and rhizomes by quinclorac split applications.

WEED TECHNOLOGY 17(1):190-194. 2003.

### Chandramohan, S., Charudattan, R., Devalerio, J.T., Hanlon, C.

Use of a multiple-pathogen bioherbicide system for integrated management of torpedograss.

IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.58 (ABSTRACT). 2003.

### Chapin, C.T., Bridgham, S.D., Pastor, J.

pH and nutrient effects on above-ground net primary production in a Minnesota, USA bog and fen.

WETLANDS 24(1):186-201. 2004.

### Chornesky, E.A., Randall, J.M.

The threat of invasive alien species to biological diversity: setting a future course.

ANN. MISSOURI BOT. GARD. 90(1):67-76. 2003.

### Colmer, T.D.

Long-distance transport of gases in plants: a perspective on internal aeration and radial loss from roots.

PLANT, CELL AND ENVIRON. 26:17-36. 2003.

### Cuda, J.P., Dunford, J.C., MacDonald, G.E., Langeland, K.A., et al

Torpedograss, *Panicum repens* L. (Poaceae): prognosis for classical biological control in the southeastern United States .

IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.29 (ABSTRACT). 2003.

### De Steven, D., Toner, M.M.

Vegetation of upper coastal plain depression wetlands: environmental templates and wetland dynamics within a landscape framework.

WETLANDS 24(1):23-42. 2004.

### Drake, L.A., Dobbs, F.C., Zimmerman, R.C.

Effects of epiphyte load on optical properties and photosynthetic potential of the seagrasses *Thalassia testudinum* Banks ex König and *Zostera marina* L.

LIMNOL. OCEANOGR. 48(1, PT 2):456-463. 2003.

### Enger, S., Hanson, S.

A summary of permitted control work for aquatic vegetation, algae, leeches, swimmer's itch, 2002.

AQUAT. PLANT MANAGE. REPORT, STAFF REPORT 35, MINNESOTA DEPT. NATURAL RESOURCES, DIV. ECOL. SERVICES, 25 PP. 2003.

### Erneberg, M., Strandberg, B., Jensen, B.D.

Susceptibility of a plant invader to a pathogenic fungus: an experimental study of *Heracleum mantegazzianum* (Giant hogweed) and *Sclerotinia sclerotiorum*.

IN: PLANT INVASIONS, EDS., L. CHILD, ET AL, BACKHUYS PUBLISHERS, LEIDEN, THE NETHERLANDS, PP. 355-372. 2003.

### Farnsworth, E.J., Meyerson, L.A.

Comparative ecophysiology of four wetland plant species along a continuum of invasiveness.

WETLANDS 23(4):750-762. 2003.

### Foxcroft, L.C., Richardson, D.M.

Managing alien plant invasions in the Kruger National Park, South Africa.

IN: PLANT INVASIONS, EDS., L. CHILD, ET AL, BACKHUYS PUBLISHERS, LEIDEN, THE NETHERLANDS, PP. 385-403. 2003.

### Frankart, C., Eullaffroy, P., Vernet, G.

Comparative effects of four herbicides on non-photochemical fluorescence quenching in *Lemna minor*.

ENVIRON. EXPERIMENTAL BOT. 49(2):159-168. 2003.

### Freund, H., Gerdes, G., Streif, H., Dellwig, O., et al

The indicative meaning of diatoms, pollen and botanical macro fossils for the reconstruction of palaeoenvironments and sea-level fluctuations along the coast of Lower Saxony, Germany.

QUATERNARY INTERNAT. 112:71-87. 2004.

Continued on next page –

**Garby, C., Thiebaut, G., Muller, S.**  
Impact of manual spring harvesting on the regrowth of a spreading aquatic plant: *Ranunculus peltatus* Schrank.  
ARCH. HYDROBIOL. 156(2):271-286. 2003.

**Grevstad, F.S., Strong, D.R., Garcia-Rossi, D., Switzer, R.W., et al**  
Biological control of *Spartina alterniflora* in Willapa Bay, Washington using the planthopper *Prokelisia marginata*: agent specificity and early results  
BIOLOGICAL CONTROL 27(1):32-42. 2003.

**Hansen, S.M., Corsini, M.**  
Program engages the disabled community in stream restoration (Washington).  
ECOL. RESTORATION 21(2):148-149. 2003.

**Hanson, M.L., Sibley, P.K., Mabury, S.A., Muir, D.C.G., et al**  
Field level evaluation and risk assessment of the toxicity of dichloroacetic acid to the aquatic macrophytes *Lemna gibba*, *Myriophyllum spicatum*, and *Myriophyllum sibiricum*.  
ECOTOX. ENVIRON. SAFETY 55(1):46-63. 2003.

**Heilman, M.A., Netherland, M.D., Smith, C., Getsinger, K.D., et al**  
Selective whole-lake management of *Myriophyllum spicatum* (Eurasian water-milfoil) with low-dose treatment of fluridone herbicide: Houghton Lake, Michigan.  
AQUATIC PLANT MANAGEMENT SOCIETY, 43RD ANNUAL MEETING PROGRAM, PORTLAND, MAINE, P. 30 (ABSTRACT). 2003.

**Kahara, S.N., Vermaat, J.E.**  
The effect of alkalinity on photosynthesis-light curves and inorganic carbon extraction capacity of freshwater macrophytes.  
AQUATIC BOT. 75(3):217-227. 2003.

**Kendig, A., Williams, B., Smith, C.W.**  
Rice weed control.  
IN: RICE: ORIGIN, HISTORY, TECHNOLOGY, AND PRODUCTION, EDS. C.W. SMITH & R.H. DILDAY, JOHN WILEY & SONS, INC., HOBOKEN, NJ, PP. 457-472. 2003.

**Knight, R.L., Gu, B., Clarke, R.A., Newman, J.M.**  
Long-term phosphorus removal in the Florida aquatic systems dominated by

**Attention authors!** Try your hand at the **APIRS** database and make sure your publications are included. To perform an author search, go to the **APIRS** web site at: <http://plants.ifas.ufl.edu> Click on **APIRS Online Database - Bibliographic Database About Plants**, then click on **Search the Online Database**. In the **Words Anywhere** box or **Author Names** box, type all or part of your last name, followed by our truncation character, \$ (for example, smith\$). A list will be produced with all publications currently in the database by author=Smith. If you have relevant publications that are not in the database (old or new), please send them to us as reprints or PDF files. They will be cataloged and an annotated citation will be added to the **APIRS** database.

submerged aquatic vegetation.  
ECOL. ENGIN. 20(1):45-63. 2003.

**Koschnick, T.J.**  
Imagine Florida without aquatic plant management.  
AQUATICS 25(1):8,10. 2003.

**Koschnick, T.J.**  
Tolerance of selected turf and ornamental plants to endothall in irrigation water.  
MASTER'S THESIS, UNIVERSITY OF FLORIDA, GAINESVILLE, 77 PP. 2003.

**Kurtz, J.C., Yates, D.F., Mcauley, J.M., Quarles, R.L., et al**  
Effects of light reduction on growth of the submerged macrophyte *Vallisneria spiralis* and the community of root-associated heterotrophic bacteria.  
J. EXP. MAR. BIO. ECOL. 291(2):199-218. 2003.

**Lindgren, C.J.**  
Using 1-min scans and stem height data in a post-release monitoring strategy for *Galerucella californiensis* (L.) (Coleoptera: Chrysomelidae) on purple loosestrife, *Lythrum salicaria* L. (Lythraceae), in Manitoba.  
BIOL. CONTROL 27(2):201-209. 2003.

**Mason, L.J., Lewitus, A.J., Wilde, S.B., Burke, M.K.**  
Constructed wetlands in detention ponds; improving water quality and preventing harmful algal blooms.  
AQUATIC PLANT MANAGEMENT SOCIETY, 43RD ANNUAL MEETING PROGRAM, PORTLAND, MAINE, P. 25 (ABSTRACT). 2003.

**MacDonald, G.E., Querns, R., Shilling, D.G., Bewick, T.A., et al**  
The influence of formulation, buffering, pH and divalent cations on the activity of endothall on hydrilla.  
J. AQUAT. PLANT MANAGE. 41:13-18. 2003.

**MacInnis-Ng, C.M.O., Ralph, P.J.**  
Short-term response and recovery of *Zostera capricorni* photosynthesis after herbicide exposure.  
AQUATIC BOT. 76(1):1-15. 2003.

**McIntosh, D., King, C., Fitzsimmons, K.**  
Tilapia for biological control of giant salvinia.  
J. AQUAT. PLANT MANAGE. 41:28-31. 2003.

**Morgan, K.L., Roberts, T.H.**  
Characterization of wetland mitigation projects in Tennessee, USA.  
WETLANDS 23(1):65-69. 2003.

**Murphy, L.R., Kinsey, S.T., Durako, M.J.**  
Physiological effects of short-term salinity changes on *Ruppia maritima*.  
AQUATIC BOTANY 75(4):293-309. 2003.

**Nakata, P.A., Kostman, T.A., Franceschi, V.R.**  
Calreticulin is enriched in the crystal idioblasts of *Pistia stratiotes*.  
PLANT PHYSIOL. BIOCHEM. 41(5):425-430. 2003.

**Nelson, L., Getsinger, K., Glomski, L. A., Kafkas, E., et al**  
Herbicides and prescribed burning for control of *Phragmites australis* at St. Johns Marsh, Michigan.  
AQUATIC PLANT MANAGEMENT SOCIETY, 43RD ANNUAL MEETING PROGRAM, PORTLAND, MAINE, P. 34 (ABSTRACT). 2003.

**Palmer, M.L., Mazzotti, F.J.**  
Structure of Everglades alligator holes.  
WETLANDS 24(1):115-122. 2004.

**Patten, K.**  
Persistence and non-target impact of imazapyr associated with smooth cordgrass control in an estuary.  
J. AQUAT. PLANT MANAGE. 41:1-6. 2003.



**Peralta, G., Bouma, T.J., Van Soelen, J., Perez-Llorens, J.L., et al**

On the use of sediment fertilization for seagrass restoration: a mesocosm study on *Zostera marina* L.  
AQUATIC BOT. 75:95-110. 2003.

**Poe, A.C., Piehler, M.F., Thompson, S.P., Paerl, H.W.**

Denitrification in a constructed wetland receiving agricultural runoff.  
WETLANDS 23(4):817-826. 2003.

**Pro, J., Ortiz, J.A., Boleas, S., Fernandez, C., et al**

Effect assessment of antimicrobial pharmaceuticals on the aquatic plant *Lemna minor*.  
BULL. ENVIRON. CONTAM. TOXICOL. 70(2): 290-295. 2003.

**Ray, S., Klenell, M., Choo, K.-S., Pedersen, M., et al**

Carbon acquisition mechanisms in *Chara tomentosa*.  
AQUATIC BOT. 76(2):141-154. 2003.

**Runes, H.B., Jenkins, J.J., Moore, J.A., Bottomley, P.J., et al**

Treatment of atrazine in nursery irrigation runoff by a constructed wetland.  
WATER RESEARCH 37(3):539-550. 2003.

**Sammons, S.M., Maceina, M.J., Partridge, D.G.**

Changes in behavior, movement and home ranges of largemouth bass following large-scale hydrilla removal in Lake Seminole, Georgia.  
J. AQUATIC PLANT MANAGE. 41:31-38. 2003.

**Sanford, M.R., Keiper, J.B., Walton, W.E.**

The impact of wetland vegetation drying time on abundance of mosquitoes and other invertebrates.  
J. AMER. MOSQUITO CONTROL ASSOC. 19(4): 361-366. 2003.

**Scherder, E.F., Ronald, T.E., Michael, L.L., Jamie, B.D.**

Rice (*Oryza sativa*) response and barnyardgrass (*Echinochloa crus-galli*) control under an intermittent flooding system.  
IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.46 (ABSTRACT). 2003.

**Smith, C.W., Dilday, R.H., Eds.**

Rice: origin, history, technology, and production.  
JOHN WILEY & SONS, INC., HOBOKEN, NJ, 642 PP. 2003.

**Soltan, M.E., Rashed, M.N.**

Laboratory study on the survival of water hyacinth under several conditions of heavy metal concentrations.  
ADVANCES ENVIRON. RES. 7:321-334. 2003.

**Steinmann, C.R., Weinhart, S., Melzer, A.**

A combined system of lagoon and constructed wetland for an effective wastewater treatment.  
WATER RESEARCH 37:2035-2042. 2003.

**Stirk, W.A., Van Staden, J.**

Occurrence of cytokinin-like compounds in two aquatic ferns and their exudates.  
ENVIRON. EXP. BOT. 49(1):77-85. 2003.

**Strong, G.L., Fischer, A.J.**

Imposed drought: a tool to reduce the competitive impact of ricefield bulrush in organic rice.  
IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.63-64 (ABSTRACT). 2003.

**Sullivan, T.**

The Lake Rousseau Sonar (fluridone) drip treatment.  
AQUATICS 25(2):4, 7-8. 2003.

**Tracy, M., Montante, J.M., Allenson, T.E., Hough, R.A.**

Long-term responses of aquatic macrophyte diversity and community structure to variation in nitrogen loading.  
AQUATIC BOTANY 77:43-52. 2003

**Van Nes, E.H., Scheffer, M., Van Den Berg, M., Coops, H.**

CHARISMA: a spatial explicit simulation model of submerged macrophytes.  
ECOL. MODELLING 159(1):103-116. 2003.

**Wang, G., Lin, Y., Li, W., Kohara, H., et al**

Mutation in acetolactate synthase gene of sulfonylurea-resistant biotype of *Monochoria korsakowii*, an annual paddy weed in Japan.  
IN: WSSA ABSTRACTS, WEED SCI. SOC. OF

AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.30 (ABSTRACT). 2003.

**Webster, E.P., Leon, C.T., Zhang, W.**

Weed control and water management strategies for herbicide-tolerant rice.  
IN: WSSA ABSTRACTS, WEED SCI. SOC. OF AMERICA, VOL.43, ED. R.J. KREMER, JACKSONVILLE, FL, P.39 (ABSTRACT). 2003.

**Willis, J.M., Hester, M.W.**

Interactive effects of salinity, flooding, and soil type on *Panicum hemitomon*.  
WETLANDS 24(1):43-50. 2004

**Yokota, E., Shimmen, T.**

Possible involvement of energy metabolism in the change of cytoplasm organization induced by a protein phosphatase inhibitor, Calyculin A, in root hair cells of *Limnobium stoloniferum*.  
PROTOPLASMA 221(3-4):217-226. 2003.

**Zhang, Z., Elsohly, H.N., Li, X.-C., Khan, S.I., et al**

Phenolic compounds from *Nymphaea odorata*.  
J. NAT. PROD. 66(4):548-550. 2003.

**\* Species targeted habitat restoration: a mitigation option within identified historical habitat and critical habitat area, by C. Carpenter. 2003. In: Proceedings of the 30th Annual Conference on Ecosystems Restoration and Creation, Hillsborough Community College, Tampa, pp. 63-69.**

Within the city limits of West Palm Beach, Florida, rather than build houses on 600 acres in endangered Everglades snail kite habitat, and to settle a suit brought by the National Audubon Society and The Sierra Club, 300 acres were given to human house-building and 300 acres were given to the snail kite. After extensive work to remove invasive plants and to re-establish cypress heads and marshes, and otherwise to restore the area to pre-1942 conditions, the snail kite has returned to the area.

## MEETINGS

### **SOUTH CAROLINA AQUATIC PLANT MANAGEMENT SOCIETY (SCAPMS).**

**August 25-27, 2004. Springmaid Beach, South Carolina.**

Contact: <http://www.scapms.org/>

### **AQUATIC WEEDS – THREAT TO ENVIRONMENT OR BOON IN DISGUISE**

**September 4, 2004. Udaipur, India.**

A national workshop sponsored by the All India Council for Technical Education in association with the College of Technology and Engineering, Udaipur.

Contact: Dr. S.M. Mathur, College of Technology and Engineering, Maharana Pratap University of Agriculture and Technology, Udaipur (Rajasthan) - 313 001, India, Phone: 0294-2470119, Fax: 0294-2471056, E-mail: [shiloo592003@yahoo.co.uk](mailto:shiloo592003@yahoo.co.uk)

### **13th INTERNATIONAL CONFERENCE ON AQUATIC INVASIVE SPECIES.**

**September 19-23, 2004. Ennis, County Clare, Ireland.**

Contact: Elizabeth Muckle-Jeffs, E-mail: [profedge@renc.igs.net](mailto:profedge@renc.igs.net) WWW: <http://www.aquatic-invasive-species-conference.org/>

### **8th CONFERENCE OF THE INTERNATIONAL SOCIETY FOR PLANT ANAEROBIOSIS (ISPA).**

**September 20-24, 2004. Perth, Western Australia.**

The ISPA is composed of scientists interested in the mechanisms of acclimation and adaptation of plants to poorly aerated environments. Plants studied include those inhabiting marine, aquatic, salt marsh, and wetland environments; and terrestrial ecosystems subjected to seasonal episodes of waterlogging or submergence (including crop species and agricultural systems).

Contact: Tim Colmer, University of Western Australia, School of Plant Biology, 35 Stirling Highway, Crawley 6009 WA, Australia, E-mail: [tdcolmer@cyllene.uwa.edu.au](mailto:tdcolmer@cyllene.uwa.edu.au) WWW: <http://www.ibba.cnr.it/ispa/>

### **MIDSOUTH AQUATIC PLANT MANAGEMENT SOCIETY (MSAPMS).**

**October 5-6, 2004. Mobile, Alabama.**

Contact: <http://www.msapms.org/>

### **31<sup>st</sup> NATURAL AREAS ASSOCIATION.**

**October 13-16, 2004. Holiday Inn Mart Plaza, Chicago, Illinois.**

*Emerging issues: Possibilities & Perils* is the theme of the 2004 meeting. Symposia and plenary sessions will focus on emerging problems and creative strategies to preserve biological resources for the future.

Contact: <http://www.naturalarea.org/>

### **FLORIDA AQUATIC PLANT MANAGEMENT SOCIETY (FAPMS).**

**October 17-20, 2004. Deerfield Beach, Florida.**

Contact: <http://www.fapms.org/>

### **ECOSYSTEMS RESTORATION AND CREATION 31ST ANNUAL CONFERENCE.**

**October 28-29, 2004. Tampa, Florida.**

This conference provides a forum for the nationwide exchange of results of the latest research on restoration, creation and management of all ecosystems, upland to freshwater to coastal.

Contact: <http://www.hccfl.edu/depts/detp/ecoconf.html>

### **24th INTERNATIONAL SYMPOSIUM - NALMS 2004 (NORTH AMERICAN LAKE MANAGEMENT SOCIETY)**

**November 3-5, 2004. Victoria, British Columbia, Canada.**

Contact: NALMS, PO Box 5443, Madison, WI 53705-0443, Phone: 608/233-2836; Fax: 608/233-3186. E-mail: [nalms@nalms.org](mailto:nalms@nalms.org) WWW: <http://www.nalms.org/>

### **66th ANNUAL MEETING, ASSOCIATION OF SOUTHEASTERN BIOLOGISTS.**

**April 13-15, 2005. Florence, Alabama.**

Contact: Scott Jewell, Phone: 336/421-0034; Email: [a2zconvention@yahoo.com](mailto:a2zconvention@yahoo.com); WWW: <http://www.asb.appstate.edu>

Meetings continued  
next page –

**\* Hemlock water dropwort (*Oenanthe crocata*), dead man's fingers.** 2001. IACR-Center for Aquatic Plant Management, England, CAPM Information Sheet 34.

This aquatic plant is "the most toxic plant in Britain to both humans and animals" - the leaves smell like celery or parsley, and are celery-like in form - horses, cows and humans mistake it for lunch.



### THIRD INTERNATIONAL CONFERENCE ON INVASIVE SPARTINA.

November 8th-10th, 2004. San Francisco, California.

"Integrating the Science and Management of Invasive Spartina"

**Contact:** Debbi Nichols, San Francisco Estuary Project, 1515 Clay Street, 14th Floor, Oakland, CA, 94612, Phone: 510/622-2304, FAX: 510/622-2501, E-mail: [dlm@rb2.swrcb.ca.gov](mailto:dlm@rb2.swrcb.ca.gov), WWW: <http://www.spartina.org/>

### 2005 AQUATIC WEED CONTROL SHORT COURSE.

May 16th-20th, 2005. Fort Lauderdale, Florida.

Aquatic, upland and invasive weed control; aquatic plant identification. A new concurrent session will focus on first time attendees with a morning of equipment calibration training and an afternoon of aquatic and natural area weed control training.

**Contact:** Tyler J. Koschnick, University of Florida, IFAS, Center for Aquatic and Invasive Plants. Phone: 352/392-5126, FAX: 352/392-3462, E-mail: [tjkoschnick@ifas.ufl.edu](mailto:tjkoschnick@ifas.ufl.edu), WWW: <http://conference.ifas.ufl.edu/aw/>

## 44<sup>th</sup> Annual Aquatic Plant Management Society Meeting - A Report

Tampa, Florida was the host city for the 44<sup>th</sup> Annual Aquatic Plant Management Society (APMS) meeting held July 11<sup>th</sup> - 14<sup>th</sup>. 220 delegates attended, including 18 students, to learn the latest in aquatic plant management from 49 papers and 23 posters. Nine of the presentations were given by students in the annual student paper competition. Seven of the students are working on their Ph.D. and two on their Master's degree.

**Sarah Habrun** of the College of Charleston won the student competition for her presentation, *Investigation of a Novel Cyanobacteria Linked to Avian Vacuolar Myelinopathy (AVM)*. AVM is a fatal bird disease and Ms. Habrun states that "the most probable hypothesis is that birds ingest a neurotoxin produced by epiphytic cyanobacteria." The toxic cyanobacteria has been closely associated with *Hydrilla verticillata* in reservoirs in the southeastern U.S., and has already adversely affected local breeding populations of American bald eagles.

All student presenters received a copy of C.D. Sculthorpe's *The Biology of Aquatic Vascular Plants*, or the text of their choice.

**Linda Nelson and Judy Shearer** from the U.S. Army Engineer Research and Development Center, Environmental Laboratory won the poster competition with their poster, "Integrating Triclopyr and a Fungal Pathogen (*Mycoleptodiscus terrestris*) for Control of Eurasian Watermilfoil (*Myriophyllum spicatum*)." The pair received a perfect score from a judging panel of student attendees.

A variety of interesting presentations were given, including economic studies, updates on biological and chemical control methods, ecological studies, and a special session on plant resistance and tolerance to aquatic herbicides.

**Dr. T. Wayne Miller, Jr.**, founder of the APMS (originally known as the Hyacinth Control Society), presented his recollections from approximately 40 years of aquatic plant management experience beginning in 1960. He displayed a photograph of water hyacinths blocking access to a boat dock in Lee County, Florida from a 1960 edition of *The Saturday Evening Post* (see below) that inspired county commissioners to create the first hyacinth control program in the nation.

A review from regional APMS chapters was given, including Florida, Midsouth, Midwest, Northeast, Texas, and South Carolina. Chapter membership numbers range from less than 100 to approximately 500 in the Florida chapter. The APMS and most regional chapters award student scholarships in aquatic plant sciences yearly.

The 45<sup>th</sup> Annual APMS meeting will be held in San Antonio, Texas. See [www.apms.org](http://www.apms.org) for more information on all APMS activities and events.

K.B.



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## AQUAPHYTE

AQUAPHYTE is the newsletter of the Center for Aquatic and Invasive Plants and the Aquatic, Wetland and Invasive Plant Information Retrieval System (APIRS) of the University of Florida Institute of Food and Agricultural Sciences (IFAS). Support for the information system is provided by the Florida Department of Environmental Protection, the U.S. Army Corps of Engineers Waterways Experiment Station Aquatic Plant Control Research Program (APCRP), the St. Johns River Water Management District and UF/IFAS.

**EDITORS: Victor Ramey  
Karen Brown**

AQUAPHYTE is sent to managers, researchers and agencies in 71 countries around the world. Comments, announcements, news items and other information relevant to aquatic and invasive plant research are solicited.

Inclusion in AQUAPHYTE does not constitute endorsement, nor does exclusion represent criticism, of any item, organization, individual, or institution by the University of Florida.

## Aquathol Manufacturer Comes Through Again!

**Mr. Bill Moore of Cerexagri**, manufacturer of the aquatic herbicide Aquathol, presents a check to Mr. Vic Ramey of the UF-IFAS Center for Aquatic and Invasive Plants. The \$15,000 unrestricted contribution



will be used by the Information Office in the production of educational materials for aquatic plant management personnel as well as for students and the general public.

This is the sixth such contribution from Cerexagri to the Center's Information Office in recent years. Mr. Gerald Adrian is the company's Aquatic Sales Manager, and

Mr. Moore is the company's Florida representative.

Previous contributions included seed money for the Office's line-drawings project and plant photography collection, the aquatic plant identification deck and the laminated photo-murals for schoolteachers. Such unrestricted support from private sources enables the Office to do much more than it could with base funding alone.

*We greatly appreciate it!*